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मानक

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Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 8422-7 (1977): Piston rings for IC engines, Part 7:
Double bevelled slotted oil control rings from 50 up to 200
mm nominal diameter G-Rings [TED 2: Automotive Primemovers]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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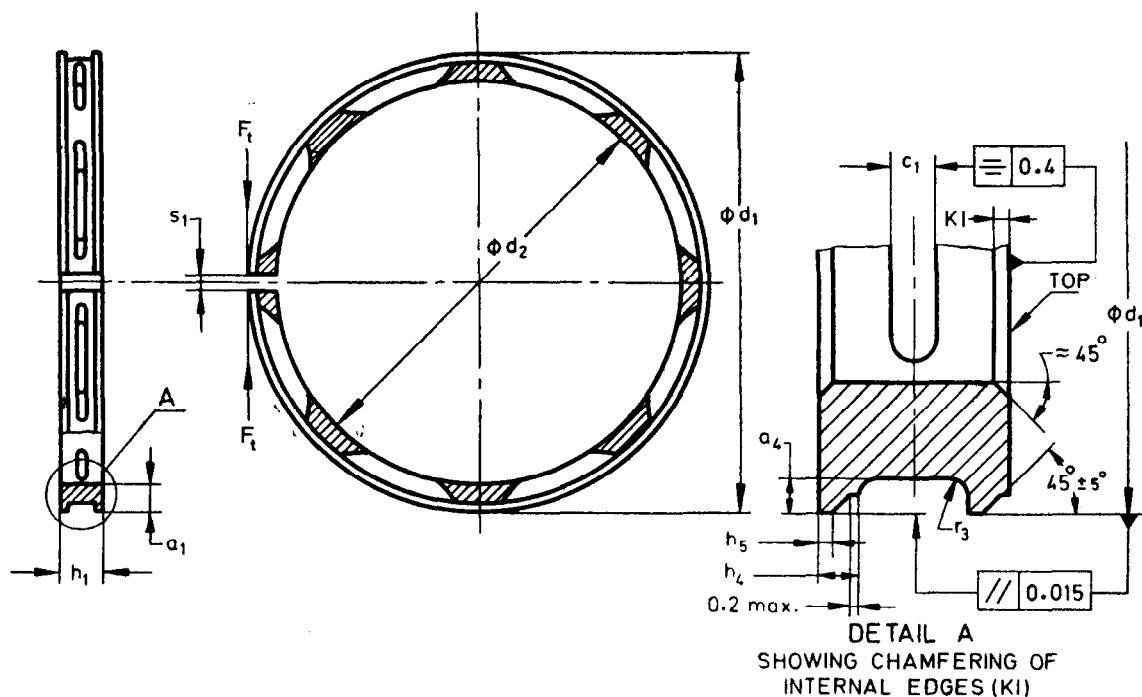


Indian Standard

SPECIFICATION FOR PISTON RINGS FOR IC ENGINES
PART VII DOUBLE BEVELLED SLOTTED OIL CONTROL RINGS
FROM 50 UP TO 200 mm NOMINAL DIAMETER
G-RINGS

1. Scope — Specifies the dimensions, tolerances, tangential loads and other details of G-rings (double bevelled slotted oil control rings) from 50 up to 200 mm nominal diameter for internal combustion engines.

2. Dimensions and Tolerances — Shall be as given in Table 1 read along with Fig. 1.



All dimensions in millimetres.

FIG. 1 DOUBLE BEVELLED SLOTTED OIL CONTROL RING (G-RING)

2.1 Arrangement of Slots — Shall be according to Fig. 2.

3. Designation — Shall include:

- a) Type of ring;
- b) Nominal diameter, d_1 ;
- c) Axial width, h_1 ;
- d) Number of this standard;
- e) Material symbol;
- f) Manufacturing process;
- g) Whether inside edges chamfered (KI); and
- h) Type of coating.

Example:

A double bevelled slotted oil control ring (G-ring) of nominal diameter $d_1 = 90$ mm, axial width $h_1 = 4$ mm with inside edges chamfered (KI) and coated with tin on all sides (SN), shall be designated as:

G-Ring 90 X 4 IS : 8422 (Part VII) KI SN

TABLE 1 DIMENSIONS AND TANGENTIAL LOADS OF G-RINGS

(Clause 2, Fig. 1 and 2)

(All dimensions in millimetres)

Nom Dia	In-side Dia	Radial Wall Thickness		Axial Width of Ring		Closed Gap	Cham-fering of Inside Edges	Rad-ius	Land h_4 for h_1 Shown in Column		Land h_5 for h_1 Shown in Column		Depth of Groove	No. of Slots	Width of Slots c_1 for h_1 Shown in Column		Tangen-tial Force F_t^* in N $\pm 20\%$ for h_1 Shown in Column	
		a_1	Tol	1	2		KI		1	2	1	2			1	2	1	2
50	45.8	2.1															9	9.7
52	47.6	2.2															9.8	10.6
53	48.5	2.25											0.6 \pm 0.1	6			10.2	11
54	49.4	2.3			4.5 -0.010	0.15 $+0.25$				0.8 $+0.10$							10.6	11.5
55	50.4	2.3			-0.022	0				-0.05							10.2	11
56	51.3	2.35															9.7	10.5
58	53.1	2.45	+0.10 -0.20 with a maxi- mum varia- tion of 0.15 in a ring														10.4	11.3
60	54.9	2.55															11.2	12.1
62	56.8	2.6					0.2 \pm 0.1						0.8 \pm 0.1				11.2	12.1
63	57.7	2.65				0.20 $+0.25$											11.5	13.7
64	58.6	2.7				0											11.9	14.2
65	59.5	2.75															12.3	14.6
66	60.4	2.8															12.7	15.1
67	61.4	2.8						0.5									12.3	14.7
68	62.3	2.85															12.7	15.1
70	64.1	2.95		4 -0.010					0.7 $+0.10$			0.25 \pm 0.07					12.6	15
72	65.9	3.05		-0.022					-0.05		0.25 \pm 0.07				1 \pm 0.1	1.2 \pm 0.1	13.3	15.9
74	67.8	3.1															13.3	15.9
75	68.7	3.15															13.7	16.4
76	69.6	3.2															14.1	16.8
78	71.4	3.3			5 -0.010	0.25 $+0.25$				0.9 $+0.10$			1 \pm 0.1	8			14.8	17.8
					-0.022	0				-0.05								
80	73.3	3.35															14.8	17.8
82	75.1	3.45															15.6	18.8
84	76.9	3.55															16.4	19.7
85	77.8	3.6															16.8	20.2
86	78.8	3.6	+0.10 -0.25 with a maxi- mum varia- tion of 0.18 in a ring														16.3	19.7
88	80.6	3.7															17.2	20.7
90	82.4	3.8															17	20.5
92	84.2	3.9					0.3 \pm 0.15										17.8	21.4
94	86.1	3.95															17.8	21.5
95	87	4				0.30 $+0.30$							1.2 \pm 0.1				18.1	21.9
96	87.9	4.05				0											18.5	22.4
98	89.7	4.15															19.3	23.4
100	91.6	4.2															19.3	23.4
102	93.4	4.3		5 -0.010	6 -0.010				0.9 $+0.10$	1.1 $+0.10$					1.2 \pm 0.1	1.4 \pm 0.1	24.3	28.7
104	95.4	4.3		-0.022	-0.022				-0.05	-0.05		0.3 \pm 0.07					23.2	27.5

105 106 108	96.1 97 99	4.45 4.5 4.5	+0.10 -0.25 with a maxi- mum varia- tion of 0.18 in a ring	5 -0.010 -0.022	6 -0.010 -0.022	0.30 ^{+0.30} 0	0.3±0.15	0.9 ^{+0.10} -0.05	1.1 ^{+0.10} -0.05	0.25±0.07	0.3±0.07	1.2±0.1	10	1.2±0.1	1.4±0.1	25.7 26.2 25.1	30.4 31 29.7									
110 112 114	100.8 102.6 104.6	4.6 4.7 4.7														26 26.9 25.9	30.8 31.9 30.6									
115 116 118	105.4 106.4 108.2	4.8 4.8 4.9														26.1 25.5 26.4	30.8 30.2 31.3									
120 122 124	110 112 114	5 5 5														27.3 26.3 25.3	32.3 31.1 30									
125 126 128	114.6 115.6 117.6	5.2 5.2 5.2														28.5 28 27	33.8 33.2 32.1									
130 132 134	119.2 121.2 123.2	5.4 5.4 5.4				0.40 ^{+0.30} 0										35.4 34.1 32.9	40.6 39.2 37.9									
135 136 138	124 125 127	5.5 5.5 5.5														33.2 32.6 31.5	38.2 37.6 36.3									
140 142 144	128.6 130.6 132.6	5.7 5.7 5.7				1.6±0.1						34.6 33.4 32.4				39.8 38.5 37.3										
145 146 148	133.2 134.2 136.2	5.9 5.9 5.9										36 35.4 34.3				41.5 40.8 39.6										
150 152 154	138 140 142	6 6 6		6 -0.010 -0.022	7 -0.013 -0.028		0.4±0.15	1.1 ^{+0.10} -0.05	1.3 ^{+0.10} -0.05	0.3±0.07	0.35±0.07		12	1.4±0.1	1.6±0.1	35.3 34.2 33.2	40.7 39.5 38.3									
155 156 158	142.6 143.6 145.6	6.2 6.2 6.2														35.4 34.9 33.8	40.9 40.2 39.1									
160 162 164	147.2 149.2 151.2	6.4 6.4 6.4			0.50 ^{+0.30} 0											36.8 35.7 34.7	42.4 41.2 40									
165 166 168	152 153 155	6.5 6.5 6.5			1.8±0.1						36.1 35.6 34.6	41.6 41.1 39.9														
170 172 174	156.6 158.6 160.6	6.7 6.7 6.7									37.4 36.4 35.4	43.2 42 40.9														

(Continued)

TABLE 1 DIMENSIONS AND TANGENTIAL LOADS OF G-RINGS — *Contd*

(All dimensions in millimetres)

Nom Dia	In-side Dia	Radial Wall Thickness		Axial Width of Ring		Closed Gap	Cham-fering of Inside Edges	Rad-ius	Land h_4 for h_1 Shown in Column		Land h_5 for h_1 Shown in Column		Depth of Groove	No. of Slots	Width of Slots c_1 for h_1 Shown in Column		Tangen-tial Force F_t * in $N \pm 20\%$ for h_1 Shown in Column	
d_1	d_2	a_1	Tol	1	2	s_1	KI	r_3	1	2	1	2	a_4		1	2	1	2
175	161.2	6.9	+0.15 -0.30 with a maxi- mum varia- tion of 0.23 in a ring	7	8	0.60	0.6±0.2	0.5	1.3	1.6	0.35±0.07	0.5 ±0.1	2±0.15	12	1.6±0.1	1.8±0.1	43.3	50.6
176	162.2	6.9															42.7	49.9
178	164.2	6.9															41.6	48.6
180	165.8	7.1															44.8	52.3
182	167.8	7.1															43.6	50.9
184	169.8	7.1															42.5	49.6
185	170.6	7.2															44.1	51.4
186	171.6	7.2															43.5	50.8
188	173.6	7.2															42.4	49.4
190	175.2	7.4															45.5	53
192	177.2	7.4															44.4	51.7
194	179.2	7.4															43.3	50.4
195	180	7.5															44.7	52.2
196	181	7.5															44.2	51.6
198	183	7.5															43.1	50.3
200	184.6	7.7															46.2	53.8

Note — Tangential force F_t values in col 1 and 2 correspond to the values of axial width h_1 shown in col 1 and 2.

*Tangential load values are applicable for material A1 only [see IS: 5791 - 1977 Technical supply conditions for piston rings for IC engines (first revision)]. For other materials load factors given in IS: 5791 - 1977 shall be used.

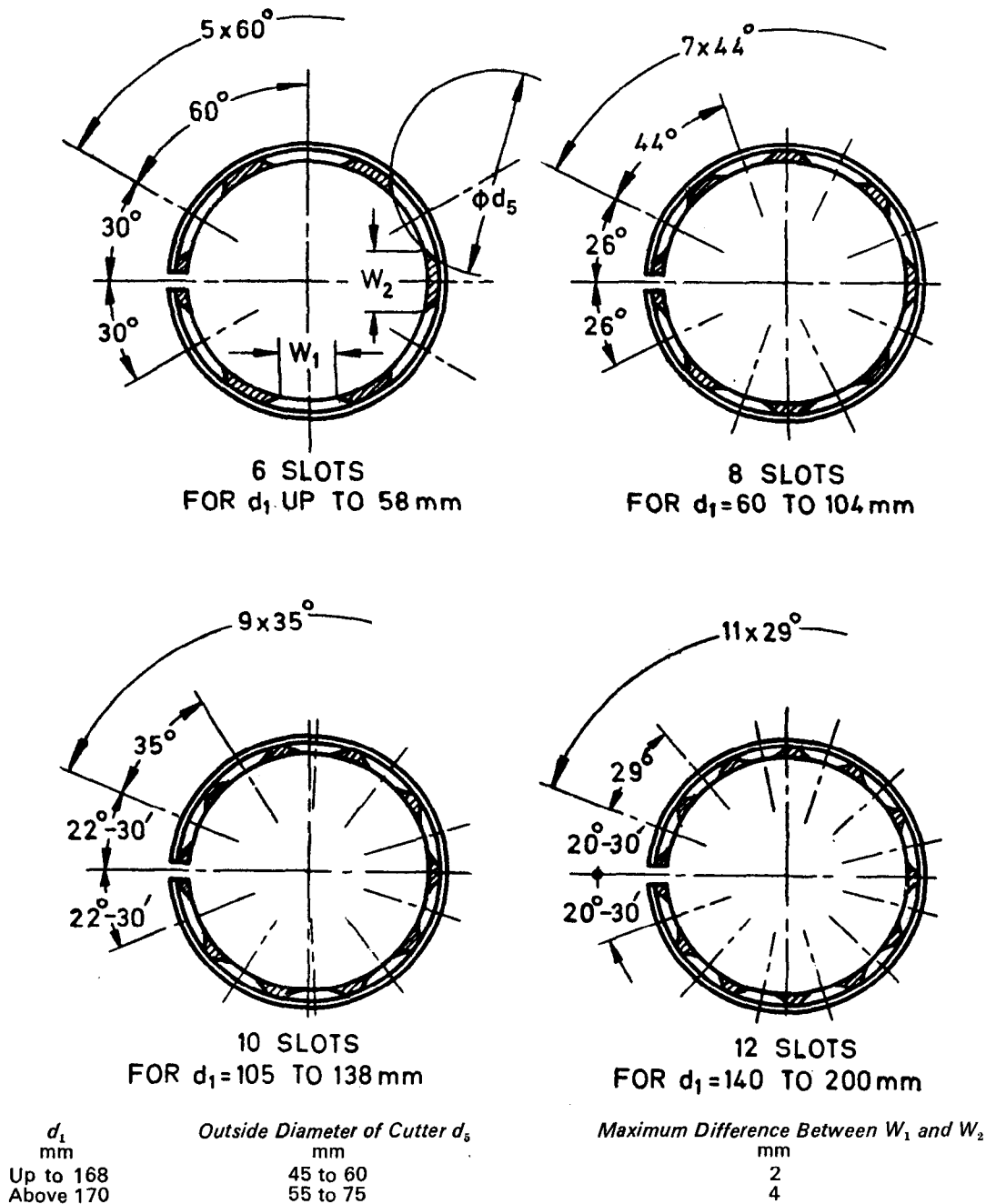


FIG. 2 ARRANGEMENT OF SLOTS

4. General Requirements — Shall be as given in IS : 5791-1977.

5. Marking — The rings which are to be fitted in a particular direction shall be marked with the word 'TOP' on the top sides of the rings. For other markings reference should be made to IS : 5791-1977.

5.1 ISI Certification Marking — Details available with the Indian Standards Institution.

EXPLANATORY NOTE

This standard is one of the series of Indian Standards on piston ring dimensions, tangential force, etc. IS : 5791-1977 is a necessary adjunct to this standard which gives details of materials, surface finish, gap types and sizes, surface coatings, manufacturing processes, etc.

In the preparation of this standard due consideration has been given to the prevalent sizes in the industry. It is recommended that for new designs, only the sizes given in this standard be used.

In the preparation of this standard assistance has been derived from DIN 70948 'Piston rings for automotive engineering, G-rings, double bevelled slotted oil control rings from 50 up to 200 mm nominal diameter', issued by DIN Deutsches Institut für Normung.